

A NEW SPECIES OF PRISTOCEUTHOPHILUS FROM
THE OLYMPIC MOUNTAINS, WASHINGTON.(Orthoptera, Tettigoniidæ)¹

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The expedition to the Olympic Mountains of Washington, sent out in the summer of 1919 by the Museum of Zoology of the University of Michigan, brought back a small collection of the Orthoptera of the region. Only a few species are represented, as the party left the field before most of the Orthoptera had become mature. Nevertheless the collection contains several species of the subfamily Rhaphidophorinæ which are of unusual interest; one of these proved to be new, and is described below.

***Pristoceuthophilus gaigei* Hubbell n. sp.**

Related to *P. tuberculatus* and *P. cercalis*, but easily distinguishable from all species of the genus hitherto described by the distinctive armament of the dorsum of the male abdomen, the form of the male cerci, and the coloration.

Description of holotype male

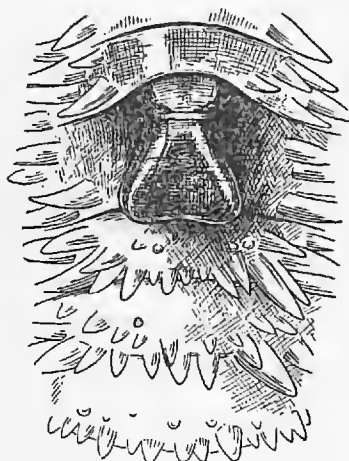
Size small for genus. Head with frontal spine well developed, but shorter and blunter than in *celatus* and *pacificus*. Antennæ slender, with approximately 120 segments, more than twice as long as body.

Pronotum slightly longer than exposed portions of meso- and metanota together. Ventral margins of thoracic terga gently arcuate, with ventro-cephalic and ventro-caudal angles rather abruptly rounded. Pronotum and mesonotum smooth; metanotum with a group of small, blunt-pointed tubercles on each side of dorsum, covering most of exposed lateral portions of tergum, but not reaching ventral border.

Terga of abdominal segments I to VIII armed with large, heavy, blunt-pointed spines, or with rounded or conical tubercles; dorsum of segment IV elevated into a large median prominence of distinctive form. Spines and tubercles of each abdominal segment arranged in two slightly irregular transverse rows along caudal margins of terga, except on VIII, where cephalic row is absent. On I to IV the spines (smallest on I) confined to lateral and dorso-lateral portions of terga; dorso-lateral spines largest (some measure .7 mm. in length), decreasing in size ventrad. Dorsum of segments

¹ Contribution from the Department of Biology, University of Florida.

I to III unarmed. Tergum of III narrower dorsally than the rest, crowded forward by enlarged dorsum of IV, which bears, in median line, a large, tall, smooth protuberance of peculiar shape (see figure) which is approximately three times as long as dorsal length of



Pristoceuthophilus gaigei
Hubbell.

Dorsal view of abdomen of
male holotype.²

segment III. Segment V armed similarly to segments I to III, but caudal row of spines continued across dorsum (the dorsal spines being, however, much smaller than those of sides), and cephalic row represented on dorsum by paired lateral spines and a row of conical tubercles. Segment VI with same arrangement as V, but dorsal spines of both rows larger; spines of cephalic row irregularly spaced, and only about one-half the height of those of caudal row. Segment VII with spines of caudal row reduced to about half the size of corresponding ones of VI; cephalic row reduced to an indistinct line of rounded tubercles. Segment VIII with cephalic row absent; caudal row reduced to a line of rounded tubercles.

On all abdominal segments except I the spines or tubercles of the caudal tend to be larger than those of the cephalic row; this is most marked in segments V to VIII, in the last of which no trace of the cephalic row remains. On segments II and III the armature almost reaches the ventral borders of the terga; posteriorly the distance to the ventral margin increases, until on VIII the tubercles are confined to the dorsum.

Supra-anal plate (tenth tergite) laterally narrow, with gently concave latero-caudal margins, produced mesially in a strongly depressed triangular lobe. Subgenital plate (hypandrium) subquadrate, narrowing distally; distal margin broadly and shallowly emarginate, disto-lateral angles rounded. Styles short, robust, bluntly pointed, with faint indications of segmentation. Penis fully extruded; ventral lobe sub-chitinous, densely clothed with fine retrorsoappressed spinules; longer than broad, with rounded tip (which hides distal portion of supra-anal plate in type).

Cerci similar in form to those of *cercalis* and *tuberculatus*. The length of cercus to tip of basal unsegmented portion about two-thirds the length of the pronotum.

Legs moderately stout. Cephalic femora unarmed. Median femora armed on both margins (left) or on caudal margin only (right) with a very minute sub-apical spinule. Median tibiae armed dorsally with

² The artist has correctly shown the main features of the abdominal specialization, but the figure contains some minor inaccuracies with regard to proportions and spine arrangement.

3-4 (left) and 3-2 (right) small, slender spines on cephalic and caudal margins respectively. Caudal femora slender, unarmed dorsally; both ventral carinae armed in distal half with distant, minute, sharp-pointed spinules, more numerous and closely spaced on caudal than on cephalic margin, the apical ones larger than the rest. Hind tibiae straight, with no trace of basal curvature or ventro-proximal lamination.

Length of antennae approximately 21 mm.; of pronotum 2.6 mm.; of cephalic femora 3.4 mm.; of caudal femora 7.0 mm.; of caudal tibiae 8.3 mm.; of cercus to tip of unsegmented basal portion 1.6 mm.

Coloration³: Antennae honey yellow; joints of distal portion infuscated in proximal half; marked with lighter annuli at irregular intervals. Head barium yellow, with indistinct markings of vandyke brown below eyes and antennal sockets, and on median frontal line. Frontal spine black, the ocelli on its sides bright sulphur yellow. Eyes black. Occiput barium yellow, with markings of vandyke brown between eyes. Thorax barium yellow on dorsum, lighter and semi-translucent along ventral margin. Two broad brownish black dorso-lateral stripes border the light-colored median area. They are most distinct on caudal portion of pronotum and on mesonotum; on cephalic half of pronotum less densely colored, and marked with small yellowish maculations. Light median stripe abruptly narrowed in middle of pronotum by convergence of dark bands cephalad; from this angulation faint longitudinal streaks of vandyke brown extend caudad within margins of median band. Abdomen with dorsal surface ocher yellow, caudad faintly marked with longitudinal brownish lines; spines and median protuberance ochraceous tawny. The dark bands of thorax extend caudad less distinctly along sides of abdomen. Cerci barium yellow proximally, shading into reddish brown at distal end of unsegmented portion; terminal segment of distal portion barium yellow. Caudal femora honey yellow dorsally, indistinctly suffused with brownish on ventral surface; outer ventral carina marked with distinct alternating light and dark patches. Traces of color pattern similar to that of *cercalis* visible on pagina. Remaining femora and tibiae honey yellow, faintly marked with brownish.

Specimens examined: One (holotype male), Lake Cushman, Olympic Mountains, Mason County, Washington, August 1, 1919 (F. M. Gaige). (In collection of Museum of Zoology, University of Michigan.) A single immature female taken June 25, 1919, in the same locality shows a similar type of coloration, and may belong to this species.

³ Where definite color names are used the terminology is that of Ridgway's Color Standards and Color Nomenclature.

Pristoceuthophilus gaigei is more bizarre than any species of the genus hitherto described, and one of the most peculiar of North American Orthoptera. It is most closely related to *P. tuberculatus* and *P. cercalis*, but far surpasses both of these species in degree of specialization of the male abdomen. All three species have the same form of male cercus, a more specialized type⁴ than is found in other members of the genus. *P. tuberculatus* approaches closer to *gaigei* in the character of the male dorsal abdominal armament than does *cercalis*.

The function (if it has one) of the peculiar median prominence on the dorsum of the abdomen can only be surmised. It may be noted, however, that on the concave sides of the structure there are two elongate light-colored areas, which are connected across its dorsum at the narrowest point; these areas are not heavily chitinized, but seem to be membranous. It is possible that they may contain the openings of scent glands, or perhaps mark the site of an eversible scent organ.

I have named this species in honor of its collector, my friend, Mr. F. M. Gaige. His field notes on the type are as follows: "In rotten logs in clearing on Staircase Trail, Aug. 1." Mr. Gaige informs me that these logs were in an apparently natural clearing in maple-alder woods, with underbrush of stag-alder, vine-maple and willows, which bordered the dense conifer forest, the edge of which was about sixty yards distant. The altitude was approximately 1050 feet.

⁴ These cerci are clearly of a more specialized type than the form normal in the Rhaphidophorinæ, but E. M. Walker (1922, Ann. Ent. Soc. Amer., xv, 19) suggests that the segmentation of the apical portion of the cercus in this group of species is an atavistic character.